

DRAFT RECLAMATION MANUAL RELEASE

Comments on this draft release must be submitted to jmorgan@usbr.gov by January 14, 2011.

Background and Purpose of the Following Draft Directive and Standard (D&S)

The goal of preparing this new D&S document and providing stakeholders with the opportunity to comment on it in draft form is to enhance common understanding of how the Radio Communications Program is administered and to enhance working relationships with Reclamation Radio Stakeholders. This will make the program more responsive to project sponsors, and more consistent Reclamation-wide and thus more effective.

The purpose of the Radio Communications Program D&S is to provide requirements for the planning, design, acquisition, installation, operations, maintenance, disposal, and encryption for radio equipment and systems supporting, Supervisory Control and Data Acquisition (SCADA), telemetry, telephone, Wide Area Network (WAN), Local Area Network (LAN), surveillance, and voice operations within Reclamation. The benefits of this D&S are to improve and standardize radio communication technologies and processes across Reclamation.

The Reclamation Manual is used to clarify program responsibility and authority and to document Reclamation-wide methods of doing business. All requirements in the Reclamation Manual are mandatory.

See the following pages for the draft D&S.

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Directives and Standards

Subject: Radio Communications Program (RCP)

Purpose: Provides requirements for the planning, design, acquisition, installation, operations, maintenance, disposal, and encryption for radio equipment and systems supporting, Supervisory Control and Data Acquisition (SCADA), telemetry, telephone, Wide Area Network (WAN), Local Area Network (LAN), surveillance, and voice operations within Reclamation. The benefits of this Directive and Standard (D&S) are to improve and standardize radio communication technologies and processes across Reclamation.

Authority: The Communications Act of 1934 (codified at 47 U.S.C. 151) National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management as described in paragraph 1.1 (Authority). NTIA Organization Act, Publ. L. No.102-538, 106 Stat. 3533 (1992) (codified at 47 U.S.C. 901 et seq.). Department of Commerce Organization Order (DOO) 10-10, October 5, 1992. Department of the Interior Departmental Manual (DM) Part 377, Radio Communications Handbook. Department of the Interior Office (DOI) of the Chief Information Officer (OCIO) Directive 2009-008, December 11, 2009, Radio Communications Site Standards.

Approving Official: Chief Information Officer, 84-21000

Contact: Information Technology (IT) Policy and Security Division, 84-21200

1. **Introduction.** This D&S establishes the requirements for acquisition, installation, and management of radio communications equipment. This D&S also establishes procedures for Radio Frequency Authorization (RFA) requests/approval, radio encryption requests/approval, and radio communication site reviews, as well as proper operation and maintenance of approved radio communications systems across Reclamation. These requirements will ensure proper radio authorization and operations throughout Reclamation.
2. **Applicability.** This D&S applies to:
 - A. All Reclamation employees and contractors who work with:
 - (1) Reclamation-owned, -operated, leased, and –maintained radio communication systems, including specialized systems (e.g., SCADA Systems, Hydromet, Geographic Information Systems, and Dam Safety Land Mobile Radio (LMR)

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systems.) This includes High Frequency (HF), Ultra High Frequency (UHF), Very High Frequency (VHF), satellite, radar, and microwave radio operation.

- (2) Reclamation radio communications systems operated and/or maintained by contract or temporary personnel.
- (3) Reclamation radio communication systems operated and/or maintained by organizations or personnel other than Reclamation.

3. Definitions.

- A. **Advanced Encryption Standard (AES).** Encryption algorithm based on Federal Information Processing Standard (FIPS) publication No. 197.
- B. **Association of Public Safety Communication (APCO).** An association of communications professionals that influences public safety communications decisions of government and industry.
- C. **Federal Information Processing Standards (FIPS).** These are publicly announced standards developed by the United States federal government for use in computer systems by all non-military government agencies and by government contractors. Many FIPS standards are modified versions of standards used in the wider community (ANSI, IEEE, ISO, etc.).
- D. **Internal Control Review (ICR).** A management means to track progress until resolution of deficiencies identified during RFA reviews and radio site reviews.
- E. **Land Mobile Radio (LMR).** A wireless communications system intended for use by users in vehicles (mobiles) or on foot (portables).
- F. **National Telecommunications and Information Administration (NTIA).** An agency in the U.S. Department of Commerce that serves as the executive branch agency principally responsible for advising the President on telecommunications and information policies, and managing the Federal use of spectrum.
- G. **Pseudo-Government Master File (GMF) Spectrum XXI Format.** Information format similar, but slightly modified, from the data format used by the NTIA in the GMF for radio frequency assignments. This data format is only used by the Spectrum XXI program to request additions, deletions, or changes to the GMF.

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- H. **Radio Assets.** Equipment consisting of transmitters, receivers, antennas, and associated equipment that is employed to emit or receive a radio frequency signal.
 - I. **Radio Communication System.** A working combination of facilities, stations, or circuits intended to perform and information transfer functions by the use of the radio spectrum.
 - J. **Radio Equipment.** Hardware which is utilized to emit or receive a radio frequency signal.
 - K. **Radio Frequency Authorization (RFA).** An authorization from the NTIA to operate on an assigned radio frequency.
 - K. **RFA Request.** A request, via the NTIA, to gain authorization to transmit a radio signal on an assigned radio frequency.
 - L. **Radio Operations.** The passing of information via a radio communication system to facilitate and expedite the transfer of information between individuals and groups of individuals.
 - M. **Radio Sharing Analysis.** A study to determine if existing radio assets or an existing radio communication system can be shared, rather than installing a new independent radio communication system.
 - O. **Supervisory Control and Data Acquisition (SCADA).** An information system used for information collection and to monitor or control automation equipment.
 - P. **Telecommunications Industry Association / Electronic Industries Alliance (TIA/EIA).** A trade association representing the global information and communications technology industries through standards development, government affairs, business opportunities, market intelligence, certification, and world-wide environmental regulatory compliance.
4. **Responsibilities.**
- A. **Chief Information Officer (CIO).** The CIO has overall responsibility for the RCP in Reclamation. This includes ensuring that radio assets are managed in accordance with this D&S throughout the organization.

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- B. **Directors.** Directors have responsibility for proper operation and management of radio communication systems, under their authority, through the life cycle of the system. This responsibility may be delegated no more than one level down (Deputy or Assistant Directors). This includes ensuring that radio resources and equipment are managed in an effective and safe manner.
- C. **Radio Communications Program Manager.** The Reclamation Radio Communications Program Manager has the responsibility for:
- (1) providing oversight and guidance for business, technical and operational radio issues for Reclamation
 - (2) acting as Reclamation's liaison with the Department, Bureaus/Offices, and other Federal Agencies in radio matters
 - (3) providing Reclamation's radio perspective and requirements to the Department to ensure the unique needs of Reclamation are met
 - (4) providing coordination and guidance on radio interoperability efforts within Reclamation.
 - (5) providing project management oversight for the implementation of Departmental radio initiatives within Reclamation.
- D. **Radio Liaison Officer.** The Reclamation Radio Liaison Officer (RLO) is a technical liaison designation, mandated by the Department, and has the responsibility for:
- (1) providing technical support to regional, area, and field offices in radio system design, including RF coverage analysis, acquisition, programming, installation, operations and maintenance, and decommissioning.
 - (2) radio system licensing – providing RFA support by reviewing all RFA packages for accuracy and completeness before submitting to the Department's Spectrum Management Office
 - (3) keeping Reclamation offices informed of current guidance for compliance with NTIA regulations and Department spectrum management procedures
 - (4) assisting the Department's Washington Office with radio frequency coordination and radio interference issues when they impact Reclamation radio communication systems

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- (5) providing oversight and guidance to ensure safe operation of all radio systems in Reclamation
- (6) providing oversight and guidance to ensure all personnel operating and maintaining radio systems have the prescribed training
- (7) performing spot checks of RFA five year review site ICR inspections.

E. **Regional Radio Coordinators.** Regional Radio Coordinators (RRC) have the responsibility for:

- (1) preparing budget estimates, tracking costs, and preparing technical information for each radio communication system within their purview
- (2) providing inventories of all radio communication system sites and equipment in their region including information on supporting infrastructure
- (3) preparing and scheduling RFA requests and reviews
- (4) preparing “request to purchase radio equipment” forms
- (5) providing assistance within their region to project teams, area offices, and field offices in the design, acquisition and maintenance of radio systems
- (6) being the focal point for information concerning radio systems Certification and Accreditation (C&A)
- (7) scheduling and monitoring of the Internal Control Reviews (ICR) and the resolution of deficiencies identified.
- (8) maintain radio site leases and memorandums of understanding (MOU) for radio sites or systems within their Region
- (9) ensuring that Reclamation owned and leased radio sites are properly recorded in the Federal Real Property Profile (FRPP)
- (10) verifying compliance with Motorola R56 site standards (applies to renovated and newly constructed radio sites where costs exceed \$10,000) prior to acceptance of any work completed.

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- F. **Reclamation Employees and Contractors.** Reclamation employees and contractors, involved in or supporting the RCP are responsible for compliance with this D&S.
5. **Goals.** This D&S establishes requirements to ensure that Reclamation radio communication systems are in compliance with NTIA and Departmental requirements for the design, acquisition, installation, operations and maintenance, use of encryption, and disposal of radio communications systems.
6. **Requirements.**
- A. **Planning and Design.**
- (1) A complete radio package will include:
 - (a) Radio frequency request memorandum
 - (b) System description, justification, and action request
 - (c) System drawing package in the Department's DesignCAD format
 - (d) Radio frequency requests in Pseudo-GMF Spectrum XXI format via Data Exchange
 - (e) Radio sharing analysis
 - (f) MOUs describing Terms and Conditions for Reclamation use of a non-Reclamation radio systems or use of Reclamation radio systems by non-Reclamation entities (Sample MOUs can be found in the DM 377)
 - (i) MOUs must be signed by authorized representatives from each entity involved
 - (ii) MOUs must require that all non-Reclamation transmitters are properly licensed.
 - (2) All new RFA requests or modified RFAs must be submitted by the RRC to the RLO in pseudo-GMF format that is generated by the Spectrum XXI software package, and must be submitted using the Spectrum XXI "Data Exchange" module.

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- (3) All new radio site construction or renovations of existing radio sites will comply with Motorola R56 design standards and DOI requirements as given in Directive 2009-008.

B. Acquisition.

- (1) Procurement of any radio equipment, regardless of cost, which utilizes radio frequencies to accomplish its task, i.e., wireless equipment, must have prior technical approval from the Reclamation Radio Liaison. Purchasing Agents must require a copy of this approval before equipment is ordered. This ensures that all wireless devices have the required radio frequency authorizations or frequency support and are compatible with existing wireless systems. RFAs or NTIA frequency support must be requested and assigned by the NTIA prior to equipment acquisition. The equipment must also meet the requirement set forth in Departmental Manual 377 DM Chapter 1 (Telecommunications Management), the Radio Communications Handbook (377 DM chapter 2), and NTIA's Manual of Regulations and Procedures for Federal Radio Frequency Management.
- (2) All new LMR radio communication systems will employ radios that conform to the APCO International, Project 25 (P25 or APCO-25) standards for digital narrowband radio technology. This standard was adopted as the Department's standard for digital narrowband radio equipment in IRM Bulletin 1996-003, dated March 4, 1996. These standards are now referred to as the TIA/EIA-102 suite of standards for digital radio. All new LMR radio communication systems will employ radios that conform to this standard.
- (3) The purchase of wireless equipment without prior frequency authorization is a violation of Federal Regulation 47 CFR 300.
- (4) The acquisition and use of Family Radio Service (FRS) and Multi-Use Radio Service (MURS) equipment is expressly prohibited.
- (5) All radio equipment acquisition costs will be tracked via local budget and finance allocation procedures.

C. **Installation.** All radio communication systems must be installed in accordance with the Department Form NRSPMO-SS-001, Radio Electronic Site Survey Instrument requirements and Motorola R56 Radio Site Design Standards.

D. Operations and Maintenance:

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- (1) **NTIA RFA Five-year reviews.** Five-year RFA reviews are required, for existing RFAs, by the NTIA in accordance with their review schedule. Existing RFAs are reviewed to confirm that the associated radio systems are still required and operational. If determined that the radio system is still required, then a site review (Program Management Review) will be performed to confirm that all information on each RFA in the system is accurate. Information on each RFA will be updated to show the current information that may have changed since the last five-year review. Site reviews are also performed to gather the required information to produce system diagrams, and to completely document the configuration of the radio system. Site reviews will be performed in accordance with Section D(2) of this D&S. System diagrams, radio frequency request memorandum, system description, justification and action request, radio frequency requests in Pseudo-GMF Spectrum XXI format via Data Exchange and a radio sharing analysis must be provided as part of the five-year review package when submitted to the Department for processing.
- (2) **Radio Communication System Site Reviews.** All Department radio communication sites will be inspected in conjunction with the RFA Five-year review process, and must conform to Department Form NRSPMO-SS-001, Radio Electronic Site Survey Instruments referenced in paragraph 6C.
 - (a) This Form has been developed by the Department's OCIO to serve as a template for conducting inspections of the Department's radio communication sites, and also for new radio communication site design and development and is required for all site reviews. This document is organized into the following sections:
 - (i) General Site Information
 - (ii) Site Design and Development
 - (iii) Site Building
 - (iv) External Grounding
 - (v) Internal Grounding
 - (vi) Power
 - (vii) Interference
 - (vii) Equipment Installation.
 - (b) The Information Technology (IT) Policy and Security Division will maintain a record of all deficiencies identified during RFA and radio site reviews. Each Area Office will be responsible to develop plans of action, obtain funding, and provide quarterly status of their efforts until resolution. The

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RRC will track plans and remediation efforts for their Region until each item is resolved and will provide quarterly updates to Reclamation.

- (c) All existing Reclamation radio communication systems are required to be evaluated annually to determine if they meet operational requirements defined within this D&S and NRSPMO-SS-001, Radio Electronic Site Survey Instrument.
 - (d) Any radio communication system not meeting the requirements set forth in this D&S is unauthorized for use
 - (e) Unless routinely occupied, radio communications facilities need not be included in annual facilities safety inspections required by OSHA , DOI and Reclamation. However, unsafe conditions noted during site visits and site internal control reviews will be documented as required by SAF 01-XX, with appropriate abatement actions taken address the deficiency.
- (3) **Radio over Internet Protocol (RoIP).** All RoIP applications will be coordinated with Reclamation IT operations, RRC and the RLO prior to implementation.

E. Disposal.

- (1) All radio communication systems must be disposed of in accordance with General Services Administration (GSA) Standard Property Disposal Procedures. Request for Removal of Property Form MS-880 (1-03) shall be used to dispose of radio equipment.
 - (2) Radio equipment shall be deprogrammed to remove all encryption keys and frequency information. Advanced Encryption Standard (AES)/Data Encryption Standard (DES) encryption modules will be removed and destroyed and frequency operating data or frequency determining modules will be removed before disposal. A radio communication technician or radio manager, at the local level, will maintain records to show that equipment removed from service has been deprogrammed and encryption keys and modules removed. These records will be retained for a period of three years as required by the National Security Agency (NSA) and will be subject to periodic review.
7. **Encryption Requirements.** All law enforcement and/or other sensitive radio communications are to be encrypted. Radio communication sensitivity will be determined by the program/project authority. Non-sensitive radio communications do not require

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encryption. The purchase of new radio equipment and systems requiring strong encryption will use at a minimum the AES based on FIPS Publication Number 197.

8. **Competency Criteria for Radio Technicians.** A Reclamation employee working with radio systems will be considered a qualified radio technician when he has demonstrated the full knowledge and skills to perform the following tasks.
 - A. Thorough understanding and application of telecommunications theories, principles, concepts, standards, and practices
 - B. Experience in integration and test of advanced RF technologies
 - C. Troubleshoot nonfunctional RF/microwave, analog, and digital circuits
 - D. Proficiency in RF and system simulation tools, RF communications, RF circuit layout, and other testing and simulation software
 - E. Experience in communications software
 - F. Knowledge of Government, Department, and Reclamation policies and directives
 - G. Knowledge of the design, construction, operation and maintenance of radio communications sites
 - H. Familiarity, experience in applying, and adherence to regulations and acceptable standards and guidelines such as:
 - (1) Occupational Safety and Health Administration (OSHA);
 - (2) Environmental Protection Agency (EPA)
 - (3) Motorola R56 Committee
 - (4) Electronics Industries Alliance/Telecommunications Industry Association (ELA/TIA)
 - (5) ANSI American National Standards Institute (ANSI)
 - (6) National Fire Prevention Association (NFPA)
 - J. Radio security

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- K. Ability to apply regulations and standards using Departmental guidelines to ensure that sites are operated, properly maintained, and inspected according to applicable standards

9. References.

- A. Reclamation Manual IRM 08-17, Bureau of Reclamation Information Technology Security Program: Configuration Management, July 7, 2004
- B. Office Chief Information Officer (OCIO) Bulletin 2002-008, technical Approval of Radio equipment Acquisitions, July 31, 2002
- C. OCIO Directive 2008-019, Technical Approval of Radio Equipment Acquisitions, June 26, 2008
- D. Reclamation Distribution A/E, Technical Approval of Wireless Equipment Acquisition, January 23, 1997
- E. Electronic Transmittal (ET) No. 02-19, technical Approval of Radio Equipment Acquisitions – Reminder Notice, August 28, 2002
- F. Information Resources Management (IRM) Bulletin 1998-001. Requirement to Procure Digital Narrowband Radio Systems in Compliance with EIA/TIA-102 Digital Narrowband Radio Standard, February 5, 1998
- G. OCIO Directive 2006-020, Department Radio Communications Encryption Policy, November 30, 2006
- H. Department of Interior Radio Communications Site Standards Policy
- I. OCIO Directive 2009-008, Department of the Interior Radio Communications Site Standards, December 11, 2009